maintain the reaction temperature within a desired range. Preferably, thermal unit 8 is adjacent to at least one surface of reaction substrate 4. For example, in the embodiment shown in Fig. 2, reaction substrate 4 sits directly on thermal unit 8. Thermal unit 8 is preferably formed of a thermally conductive material, such as copper or aluminum or other suitable materials. More preferably, thermal unit 8 is in thermal communication with reaction substrate 4 such that variations in the temperature of thermal unit 8 are quickly transmitted to the reaction zone 28 in substrate reservoir 6. Although shown as separate components, reaction substrate 4 and thermal unit 8 may be integrally formed. Heating source 30 includes cartridge resistance heaters 30 mounted horizontally within the thermal unit 8, although other heating sources may be utilized. Cooling source 20 includes a pump 18 delivering a cooling agent 34 such as water or freon through a serpentine channel 32 within thermal unit 8 (Fig. 2), although other cooling sources may be utilized. As described above for reaction substrate 4, multiple resistance temperature detectors 26 can be mounted at various locations within thermal unit 8 in order to monitor temperature variations.

Please replace the second full paragraph on page 14 with the following:

As an example, and again referring to Fig. 5, an embodiment of an aspect of the invention comprises the following steps. Thermal unit 8 and base plate 52 are assembled, and reaction substrate 4 is positioned on top of thermal unit 8 (step 1). A predetermined amount of reactants 28 at least partially embodied in a liquid comprising a film thickness L are added to individual reaction vials 24. The invention contemplates that the use of individual reaction vials will enable multiple reagents or catalysts to be tested in one experiment. The vials 24 are sealed with a septum cap 72 and placed in wells 6 in reaction substrate 4 (step 2). Head plate 10 is then lowered on to reaction substrate 4 with the aid of counterweight system 60 (see Fig. 4) and positioned so that base plate studs 54 can be fastened to head plate 10 (step 3). Once a seal between head plate 10 and reaction substrate 4 has been established, controller 70 is used to heat thermal unit 8 (step 4). Gas 46 is pumped from gas supply 38 into head space 12 to establish an atmosphere of predetermined pressure (step 5). The gas may be a gas inert to the reaction, or may

comprise a second reactant. The invention contemplates that the atmosphere in the headspace outside of the reaction vial 12 will equilibrate with the atmosphere inside the reaction vial 76, thereby presenting gaseous reactants 46 to each set of liquid reactants presented in each vial. Computer 70 controlled resistance temperature detectors 26 enable precise control of the temperature of the reaction substrate, thermal unit and head plate. Surface heaters 40 on the head plate 10 are adjusted to prevent condensation of gas 46 in the headspace 12 (step 6). To terminate the reaction, heaters 30 in thermal unit 8 are turned off and a cooling agent 34 is pumped through channels 32 in the thermal unit 8. Once the reaction substrate 4 is cooled, the head plate 10 is removed with the aid of the counterweight 60 (Fig. 4), and reaction vials 24 are removed for subsequent analysis.

IN THE CLAIMS

Please cancel claims 5, 16 and 30 without prejudice or disclaimer to further prosecution of this application on the merits.

Please rewrite claims 1, 4, 6, 13, 14, 15, 17, 18, 21, 31, 32 and 33 as follows:

1. (Amended) An apparatus for the rapid screening of potential reactants, catalysts or reaction conditions, the apparatus comprising:

a reaction substrate comprising at least one substrate reservoir, said reaction substrate having a first temperature; and

a head plate positioned to provide a sealed pressurized headspace adjacent to said substrate reservoir, said head plate having a second temperature and said sealed pressurized headspace having an adjustable pressure in a range of between about 1 atmosphere and about 50 atmosphere.

4. (Amended) The apparatus of claim 1, further comprising a gas source in communication with said sealed pressurized headspace, wherein said gas source includes at least one gas.